

SYNTHESIS AND CHARACTERIZATION OF CURCUMINOIDS BY CLAISEN-SCHMIDT CONDENSATION AND THEIR CYTOTOXIC EFFECTS ON HELA AND K562 CANCER CELL LINES

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SUPERVISOR'S DECLARATION

We hereby declare that we have checked this thesis and in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Master of Science in Industrial Chemistry.

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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LIST OF SYMBOLS

| | |
|--------------------|--------------------|
| α | Alpha |
| β | Beta |
| δ | Chemical shift |
| $^{\circ}\text{C}$ | Degree celcius |
| g/mol | Gram per mol |
| Hz | Hertz |
| hr | Hours |
| <i>J</i> | Joule |
| L | Litre |
| MHz | Megahertz |
| $\mu\text{g/ml}$ | Microgram per ml |
| μM | Micromolar |
| mg | Milligram |
| ml | Millilitre |
| mm | Millimetre |
| min | Minute |
| nm | Nanometer |
| N | Normality |
| ppm | Parts per milliomm |
| % | Percentage |
| λ | Wavelength |
| W | Watt |

LIST OF ABBREVIATIONS

| | |
|---------------------------------|--|
| MTT | 3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide |
| ABL | Abelson murine leukemia |
| CH ₃ COOH | Acetic acid |
| AML | Acute myeloid leukemias |
| NH ₄ Cl | Ammonium chloride |
| BDMC | <i>Bis</i> -demethoxycurcumin |
| B ₂ O ₃ | Boron oxide |
| Br | Bromine |
| CO ₂ | Carbon dioxide |
| ¹³ C-NMR | Carbon nuclear magnetic resonance |
| cm | Centimetre |
| CHCl ₃ | Chloroform |
| Cl | Chlorine |
| CC | Column chromatography |
| DMC | Demethoxycurcumin |
| CH ₂ Cl ₂ | Dichloromethane |
| DMSO | Dimethyl sulfoxide |
| DMEM | Dulbecco's Modified Eagle's Medium |
| EtOAc | Ethyl acetate |
| FBS | Fetal bovine serum |
| F | Fluorine |
| FTIR | Fourier transform infrared spectroscopy |
| GC-MS | Gas chromatography-mass spectroscopy |
| g | Gram |
| Hex | Hexane |
| HPV | Human papillomavirus |
| NH ₂ NH ₂ | Hydrazine |
| kg | Kilogram |
| HCl | Hydrogen chloride |
| MS | Mass spectroscopy |
| MeOH | Methanol |

| | |
|---------------------------------|--|
| OCH ₃ | Methoxy |
| MWI | Microwave irradiation |
| MACs | Mono-carbonyl |
| n-BuNH ₂ | n-butylamine |
| NMR | Nuclear magnetic resonance |
| OD | Optical density |
| cm ⁻¹ | Per centimetre |
| KBr | Potassium bromide |
| ¹ H NMR | Proton nuclear magnetic resonance |
| QSAR | Quantitative structure-activity relationship |
| rt | Room temperature |
| SARs | Structure-activity relationship |
| NaOH | Sodium hydroxide |
| Na ₂ SO ₄ | Sodium sulphate |
| H ₂ SO ₄ | Sulphuric acid |
| TMS | Tetramethylsilane |
| TLC | Thin layer chromatography |
| UV-Vis | Ultraviolet-visible spectroscopy |
| v-Scr | Rous sarcoma virus |